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ABSTRACT

This study examined the reliability and validity of the Application of Cognitive Functions Scale (ACFS) (C. Lidz and R. Jepsen, 1997) Behavior Observation Rating Scale. The study involved observational ratings of 25 participants who were enrolled in a preschool for children with developmental disabilities. Validity was investigated by determining how well the researcher's ratings during a sample classroom activity and speech therapy session correlated with the teachers' and speech therapists' ratings of the children's general behavior in class and in speech therapy, respectively. Reliability was examined by determining inter-rater agreement between scores of the scale's author and the researcher by reviewing videotaped samples of preschool children. In addition, reliability was examined by investigating the consistency of the children's behavior across the two varying situations, a speech session, and a general classroom session. Appendices contain the teacher/therapist behavior rating scale, and the ACFS scale. (Contains 4 tables and 42 references.) (Author/SLD)

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ED 438 294

VALIDITY AND RELIABILITY OF THE ACFS BEHAVIOR OBSERVATION RATING SCALE

BY:

Ziona Aranov

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Abstract

This study examines the reliability and validity of the Application of Cognitive Functions Scale (ACFS) Behavior Observation Rating Scale (BORS). The study involved observational ratings of participants' (25) who were enrolled in a preschool for children with developmental disabilities. Validity was investigated by how well the researcher's ratings during a sample classroom activity and speech therapy session correlated with the teachers' and speech therapists' ratings of the children's general behavior in class and in speech therapy, respectively. Reliability was examined by determining inter-rater agreement between scores of the scale's author and the researcher by reviewing videotaped samples of preschool children. In addition, reliability was examined by investigating the consistency of the children's behavior across the two varying situations, of speech session and a general classroom session.

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Introduction

Dynamic assessment was originally proposed by the Soviet psychologist L.S. Vygotsky (Berk & Winsler, 1995) as an alternative to traditional psychometric assessment. Vygotsky criticized traditional approaches for lack of treatment validity and limited information about the child's development (Berk & Winsler, 1995).

The uniqueness of a dynamic approach to assessment can be best characterized by the interaction between the examiner and the examinee. In contrast to traditional assessment where the examiner is confined to specific rules and guidelines during the assessment, according to the model used in this study, the examiner administering a dynamic approach functions as a facilitator, interacting with the child in ways that reveal the child's potential or emergent level of development. Due to the interactive nature of the procedure, the examiner has an opportunity to observe, make inferences, and remediate problems of cognitive processing in the child (Lidz, 1995).

Dynamic assessment procedures characteristically follow a test-intervene - (mediate) post-test format that allows documentation of the child's responsiveness to instruction (intervention-mediation). Most of the existing procedures are appropriate for use with either school age or older learners. There are as yet no dynamic assessment procedures available for use with children younger than five years.

Lidz and Jepsen (1997) designed the Application of Cognitive Functions Scale to assess higher mental functioning in children between the ages of three through five years. In addition to providing scores for successful solution of six tasks and responsiveness of the child to facilitation of each task, the ACFS also includes a Behavior Observation Rating Scale (BORS) for each of the tasks. The examiner rates the child's behavior on

seven parameters during administration of each pretest and mediation phase of the six activities. Since the ACFS is a relatively new procedure, information is needed to document its validity and reliability. This study will contribute to this need by investigating the validity and reliability of this subcomponent of the ACFS, the BORS.

Literature Review

Many standardized procedures provide an informal checklist or rating scale for the examiner to record the child's interactive behavior during the course of the administration of the procedure. Glutting, Oakland, and McDermott (1989) are among the few who have tried to formalize this process. However, their scale is appropriate for children of school age. The ACFS is unique in including both qualitative and quantitative scores for preschool children. The contribution of the qualitative aspect of the information, provided by the Behavior Observation Scale, requires further study.

This literature review focuses on documentation of the behaviors incorporated in the BORS (Appendices A & B). The ACFS authors selected the seven parameters because they judged them to be observable and measurable during the administration of the ACFS and, primarily, because the behaviors were representative of instructionally relevant descriptors of young children. These parameters include the following behaviors: self-regulation, persistence, frustration tolerance, flexibility, motivation, interactivity, and receptivity. The ratings reflect the extent to which the young child is developing into a thinking, reflective, metacognitive learner.

Metacognition refers to knowledge concerning ones' own cognitive processes and products (Flavell, 1976a). Metacognitive strategies include those that connect new

information to former knowledge, planning, monitoring, and selective thinking. There is evidence that increases in learning have followed direct instruction in metacognitive strategies (Flavell, 1976a). These results suggest that direct teaching of these thinking strategies may be useful. It is therefore relevant to assess metacognitive characteristics in children since there is the potential for linkage with instruction. Learning how to learn and developing a repertoire of thinking processes that can be applied to solve problems is a major goal for education. However, very young children are only at an "emergent" level in development of these metacognitive abilities. Nevertheless, these capacities begin to emerge at approximately the age of three years in the child with typical development (Flavell, 1976b).

Review of the literature related to the specific components of the Behavior Observation Rating Scale follows:

Self-regulation

As defined by the BORS (see Appendixes A and B), self-regulation means regulating and maintaining attention and controlling impulsivity. Self-regulated learning is pivotal to student achievement; the most effective learners are self-regulating (Butler & Winne, 1995). In the academic context, self-regulation includes setting goals for increased knowledge, considering strategies for achieving those goals without wasting time or energy, and regularly monitoring progress. Self-regulated students know their own capacities, beliefs, and knowledge and can adjust their goal -setting and motivation and even create new strategies to improve their progress.

Feedback, however, is essential to self-regulated learning, but self-regulated learners often create their own internal feedback methods, as well as seek feedback from external sources (Butler & Winne, 1995). Self-regulated learning might follow these stages: 1) learners begin with knowledge and beliefs, strategies, and multiple motivations; 2) they progress to setting goals and adapting tactics and strategies for reaching those goals; 3) Internal feedback and self-monitoring advanced achievement of goals or is adjusted if progress seems unsatisfactory and 4) results are subjected to external feedback (Butler & Winne 1995; Zimmerman, 1990).

It is important to understand that the self-regulated learner is not necessarily discouraged either by internal or external negative feedback; he merely re-creates his strategies and / or adjusts his goal setting or time frame for achieving those goals (Butler & Winne, 1995; Zimmerman, 1990). In effect, the feedback loop itself is a self-oriented process in which the student engages in a cycle of receiving feedback from himself or external sources, altering his self-perceptions, changing behaviors, or changing a learning strategy, and repeating the cycle until the goal is achieved (Zimmerman, 1990).

The feedback itself that is so pivotal to self-regulated learning might be knowledge of results, task validity feedback, cognitive validity feedback, or functional validity (Butler & Winne, 1995). Task validity feedback defines the task; cognitive validity feedback describes the learner's understanding of the relationship between a step towards learning and the actual knowledge; and functional validity feedback describes the actual relationship between the student's own estimates of achievement and actual performance.

Self-regulated learning has a long-range quality. It does not depend on either self-efficacy or immediate goal achievement but, instead, on a student's awareness of the

relationship between strategy and response and, then, learning outcomes and the use of and adjustment of strategies to achieve academic goals (Zimmerman, 1990). Put more simply, the learner who cannot self-regulate might set a goal and work towards it, but if he does not achieve it quickly, he will give up and abandon the task or wait for further external guidance. The self-regulated learner repeatedly reviews his progress and repeatedly adjusts his strategies until he perceives progress, with or without the external feedback (Zimmerman, 1990). Zimmerman (1990) also notes that motivation is a critical part of self-regulation in that learning activities are consistently self-initiated.

Although some students are inherently self-regulating, many have to be taught self-regulating strategies. Sawyer, Graham, and Harris (1992) observed that effective strategy instruction included target strategies, information about the use and significance of strategies, and the development of self-regulation skills for monitoring and maintaining strategies. In their study of teaching writing strategies to fifth and sixth grade learning disabled students, these authors found that teaching self-efficacy, as well as performance and components analysis strategies improved students' writing skills and willingness to apply strategies to achieve their writing goals.

Persistence

On the BORS (see Appendices A and B), persistence is defined as completion of a task or activity without seeking to terminate it.

In a learning context, persistence can be measured by the total time or numbers of attempts at which an individual works at a given task before turning to some alternative,

especially assuming the task is difficult or challenging and the individual has all the time he wants to complete it (Feather, 1962).

Persistence can be a character trait or it might be resistance to extinction or it can be a motivational phenomenon (Feather, 1962). In the academic setting, teachers will find that some students are naturally more persistent; they might even be labeled stubborn. Others will stay with a task if encouraged by the teacher (or peer approval); still others will give up easily with or without encouragement if confronting something they cannot master quickly. Some students will refuse to give up unwanted behaviors, even if nothing reinforced these behaviors except the students' own will or even if they are punished for those behaviors (Feather, 1962; Krantz & Scarth, 1979).

Persistence can be encouraged and developed, especially in young children and even among handicapped children (Karnes, Johnson & Beauchamp, 1989; Krantz & Scarth, 1979). Krantz and Scarth (1979) noted that teacher behaviors, such as verbal reinforcement, prompting, and proximity tended to reinforce persistence on assigned tasks in preschool children. Karnes et al. (1989) found that teaching problem-solving strategies to preschool handicapped children with a view towards developing their fine motor skills not only increased their willingness to stay on-task but helped them become more systematic in problem-solving tasks. As the children began to develop these problem-solving strategies and become more systematic and organized in their work, their own success encouraged persistence.

Krantz and Scarth (1979) also noted that a teacher's irrelevant comments prior to children's beginning an assignment had the effect of distracting them from staying on-task, whereas teachers whose students demonstrated high task persistence were those who

used praise freely and minimized criticism. Hamilton and Gordon (1978) observed that students varied within themselves regarding persistence in classroom activities, while, in turn, teachers varied their behaviors in relation to individual children. The authors hypothesized that praise and staying on-task would correlate positively and that criticism and giving up would also correlate positively.

However, Hamilton and Gordon (1978) found that while both praise and criticism correlated positively with persistence in regular classroom tasks, there was a negative correlation between teacher praise and children's persistence in the experimental task. In the experimental situation, teachers withheld both praise and criticism, which indicated that those children who had come to expect a lot of teachers' attention in the past gave up easily when it was not forthcoming. This agrees with Krantz and Scarth (1979), who found a correlation between praise and staying on task and between criticism and giving up easily.

Frustration Tolerance

As described by the BORS (see Appendices A and B), the definition of frustration tolerance is recouping and continuing with a task when the child becomes frustrated, or calming down and accepting redirection when upset. At any age, frustration occurs when an individual is prevented from reaching a desired goal, possibly because someone or something is in the way or possibly because there is a lack of skill or knowledge about how to achieve an objective (Agnew, 1984). When aspirations and expectations fall far apart on the individual's scale of reality, there is strain, which also occurs when achievements do not meet expectations. Frustration also occurs as a consequence of

deprivation, punishment, feelings of inadequacy, or threats to self-esteem (Fabes, Eisenberg, McCormick & Wilson, 1988).

These contributing factors to frustration are the same for children as for adults; the main difference is that the child's aspirations, goals, and expectations necessarily differ from those of the adult. Young children tend to become frustrated over object deprivation. If thwarted in their desire to hold or play with an object, their frustration often leads them to physical strategies (hitting or crying) to resolve their feelings of frustration and conflict with the source of their frustration. Somewhat older children might also use verbal strategies (loud or insulting arguments) to deal with frustration, but either way, conflict over objects or anything else represents the child's inability to tolerate frustration (Wheeler, 1994).

Frustration tolerance, therefore, is a critical component of socialization of young children, not only in the sense of developing general social skills but in the very important context of learning. If the child cannot learn to tolerate frustration each time an objective is not immediately achieved or satisfied, the child will not develop the patience or try new strategies or have the persistence to keep trying until his objectives are accomplished (Fabes & Eisenberg, 1992; Wheeler, 1994).

If conflict due to frustration among young children were only about objects, it would be relatively easily resolved, if only by presenting the frustrated child with another toy or otherwise redirecting the child's attention to something equally appealing. The point of teaching children to tolerate frustration is that if the young child cannot learn to take turns playing with a particular toy, it is unlikely the child will learn to wait her turn in more difficult and critical situations, such as needing teacher's help with an academic task, or learning

new skills, transferring to a new school, learning to make friends, or learning to get along with a new teacher in the next grade (Levin, 1994; Wheeler, 1994).

Frustration tolerance is not only a learned social skill but also a learned intellectual skill (Stone, 1993). The child, who can learn to wait her turn to play with a particular toy or find something else to do, is the child who can learn to try a different approach to a difficult and challenging academic task when the first approach does not work. Frustration tolerance, in effect, underlies all problem-solving skills and strategies that are the basis for all learning. Learning itself is by definition a confrontation with the unknown, but the confrontation often involves frustration that must be tolerated and coped with constructively if the learning goal is to be achieved (Fabes & Eisenberg, 1992; Feather, 1962; Stone, 1993).

Moreover, because the inability to tolerate frustration often results in anger and disruptive behaviors among young children, a whole classroom can be prevented from learning by the frustration responses of one child. It is therefore critical that even the youngest children learn to work through their reactions to frustrations. The inability to tolerate frustration in a learning context is the opposite of the persistence needed to complete a task and achieve a goal (Fabes & Eisenberge, 1992; Feather, 1962; Stone, 1993).

Flexibility

Flexibility as defined by the BORS involves trying alternative approaches or solutions to problems, self-correcting, or voluntarily changing an approach when a previous attempt is found ineffective. Although persistence and willingness to stay on task

for as long as it takes to complete the task are considered pivotal to learning, these characteristics can be self-defeating if the student's persistence only means doing the same thing over and over with few or no results and little or no progress towards the desired objective (Nelson-LeGall & Scott-Jones, 1985).

Persistence has to be accompanied by flexibility if any learning is to occur. Merely staying on task can be counterproductive if the task is especially difficult and, even more so, if asking for help or stopping and starting over with an entirely different strategy would solve the problem more effectively and efficiently (Cheyne & Rubin, 1983, Kanevesky, 1990: Nelson-LeGall & Scott-Jones, 1985).

This does not mean that it is desirable that a student should take one look at a problem and immediately call for help. It does mean that after a student, even the youngest student, has made a concerted effort to learn how to solve a problem independently and has made no progress, she should be flexible enough to seek or try alternative approaches. Alternative approaches might include going beyond the obvious first solution and trying something radically different just to see what will happen, such as the use of an entirely different tool or device to achieve the same goal. Alternative solutions might also include just a different way of using the original approach (Cheyne & Rubin, 1983).

As indicated on the AFCS, the lack of flexibility is shown by a student who makes no changes in his approach to a problem, when the first try does not work, and he seems to be stuck on the first attempt. Such students might simply wait passively for the teacher to help; this is not a valid alternative but instead is the same as doing nothing because the task seemed too difficult. Flexibility is shown by the student who is willing to try active,

goal-oriented alternative approaches or strategies to problem solving. In a learning situation, the student who is flexible will not only use different strategies but apply each strategy in different ways, using information provided by teachers or even the examples provided by or other students (Nelson-LeGall & Scott-Jones, 1985; Stone, 1995).

The point is that the flexible student does not abandon the task but only relinquishes a particular strategy that has proven ineffective. He does not absolutely refuse assistance but seeks guidance or help only to the point that he can try independently to complete the task. The flexible student might try to adapt strategies learned from past problem solving and experiment with such strategies to see if they are effective with the present problem. The flexible student might even try strategies in a different way (Kanevesky, 1990; Cheyne & Rubin, 1983; Tegano, Sawyers &Moran,1989).

At the preschool level, play, especially dramatic and constructive play, is the ideal opportunity for children to display flexible behaviors, because play is intrinsically motivated and process-oriented. Play also permits children to use divergent thinking processes and to research solutions to problems, as well as express their creativity. In constructive play, children who are flexible will invent, re-invent, design, re-design, and create and re-create as they experiment with tools and materials. In dramatic play, children will draw on many experiences and synthesize them together to form new experiences, but if the results are not satisfactory, the flexible child will strive for a new synthesis of past and present experiences (Stone, 1995; Tegano et al., 1989).

In play, flexible children test out concepts, revising and refining them in response to the perceived effectiveness of solving a problem. In effect, although the young child is not likely to talk through his problem-solving strategies, his degree of flexibility can be

discerned by his willingness and ability to play through solutions to problems (Stone, 1995; Tegano et al.,1989).

Motivation

The BORS defines motivation as showing positive affective response to and interest in the activity.

Intrinsic motivation has been defined as participating in an activity simply out of curiosity, an inner need to know about something and the desire to participate in an activity purely for the sake of completing a task (Deci, Vellerand, Pelletier & Ran, 1991). The intrinsically motivated student is also likely to retain the concepts learned and to feel confident about engaging in unfamiliar learning situations (Dev, 1997). However the amount of interest generated by the task also plays a role in the motivational orientation of the learner. An assigned task with zero interest value is less likely to motivate the student than is a task that arouses interest and curiosity.

Berlyn and Frommer's study (cited in Gottfried, 1983) found that intrinsic motivation was affected by the type of stimuli with which young children were presented, such as stories or pictures that were incongruous, that moved and that challenged the children. Academic intrinsic motivation was found to be correlated with academic achievement in students with learning disabilities (Dev, 1997). The development of skills required for academic achievements are strongly influenced by instructional design. If the design undermines student ability and skill level it can reduce motivation. Students with learning disabilities have shown an increase in academic learning after engaging in interesting tasks such as computer games and programs designed to enhance learning (Dev, 1997).

Also, if the assigned task is within the child's ability level, the child is likely to be intrinsically motivated to tackle to task.

Teachers can enhance the intrinsic motivation of their students by allowing the children to feel that they are in control of their own learning to a certain degree. Intrinsic motivation can develop when students are encouraged to monitor and reinforce their progress themselves (Brophy, 1983). Another way to maintain intrinsic motivation is when the student is given the opportunity to feel competent by learning through discovery (Adelman & Chaney, 1982). Some studies suggest that rewards have an undermining effect on intrinsic motivation. For example, Gottfried (1983) points out that preschool children who expected and received an award for engaging in an intrinsically interesting activity subsequently showed less interest in playing with that activity during free play. In contrast, verbal praise increased intrinsic motivation because it drew children's attention to their competence. However, praise should not be given indiscriminately or too often or it loses its value (Gottfried, 1983).

Interactivity

The BORS defines interactivity in terms of reciprocal social interactions such as engaging in turn-taking conversation with elaboration.

Patrick (1997), Schickendanz (1994), and Stone (1993) noted that there was a strong association between students' social competence and academic performance, especially in the areas of school adjustment, achievement, and motivation. In other words, socially popular children are also likely to be academically successful children. The well-socialized and socially accepted student is one who is comfortable with his peers

and adults, can express feelings and recognize the feelings of others (empathy), knows how to share time, space, and materials, and abides by classroom norms, rules, and expectations. Students who act cooperatively with peers, respond appropriately to teacher directions, participate willingly in class activities, and recognize that different behaviors are acceptable for different situations are the socially responsible students who pave the way for their own learning, and, by the good example they set, for learning by their peers (Patrick, 1997; Stone, 1993).

Social competence in the school setting implies successful adjustment to school, involvement in academic processes, and a commitment to learning. Students who make a successful adjustment to school are not likely to drop out or engage in counterproductive and anti-social behaviors while in school. Yet if students do not successfully adjust to the school setting and, consequently, are rejected or shunned by their classmates, they are almost by definition, more likely to avoid school or, if forced to attend, disrupt the classroom or be inattentive to what goes on in the classroom. Thus, the student who cannot engage productively and competently in social situations is also not likely to be in a position to learn academically (Patrick, 1997; Schickendanz, 1994).

Patrick (1997) noted that not only was low social acceptance strongly related to poor school achievement but it was also one of the strongest predictors of school dropout. By contrast, children who perceived themselves to be socially acceptable or, better still, were really popular, were also motivated to learn. For the youngest children, in fact, their own perceptions of their social competence seemed to be a stronger predictor of motivation to learn than their own or teachers' perceptions of academic performance (Stone, 1993; Patrick, 1997).

Quay and Jarret (1986) found in a study of social reciprocity among handicapped and nonhandicapped students that social competence or lack of it significantly affected the learning process. Because handicapped students were less likely to possess competent social skills, they were more likely to be rejected by peers in a mainstream setting. Yet, if they learned good social reciprocity from their nonhandicaped peers, their social acceptance improved; they felt more comfortable in the school setting, and they finally were more receptive to academic learning.

One important purpose of mainstreaming handicapped children is to teach them by the example of their nonhandicapped peers good social skills that, in turn, may promote academic learning (Quay & Jarrett, 1986). While some studies have suggested that if handicapped children were socially rejected in the mainstream setting, they might be more comfortable with other handicapped children, Quay and Jarrett (1986) observed that handicapped children could learn reciprocal social skills more effectively from peers who already possessed these skills.

Receptivity

The BORS defines receptive learners showing openness toward learning and to being influenced by teachers/parents/therapists. More specifically, at three years old, receptive learners are relatively socialized, able to interact with peers and adults, are not excessively dependent on teachers or other adults, usually approach new experiences willingly, usually can cope with rejection or setbacks relatively calmly, are capable of some objective observation, can empathize with others, and can even show a burgeoning sense of humor (McClellan & Katz, 1993; Stone, 1995).

By four and five years old, receptive learners, exhibit great curiosity about their environment and others in it, and increasingly imitate behaviors of peers and teachers or other caregivers/instructors. Four and five old receptive learners are capable of conceptual learning, classification skills, operational logic, and symbolic or abstract thought. At these ages, receptive learners are also interested in sharing and exchanging information, asking questions and demonstrating an interest in good answers (often followed by still more questions), and participating in ongoing discussions of any topic (Edwards & Springate, 1995; McClellan & Katz, 1993; Stone, 1995).

The nonreceptive young learner tends to act as if he were neglected by adults, isolated by peers, bored with ongoing activity (especially if not directly focused on himself and his immediate wants), suspicious of or openly hostile to new experiences or information, indifferent towards others instead of curious about his environment or towards any instruction, and obviously discouraged when faced with any setbacks or rejection (Katz, 1993).

Perhaps what most distinguishes the receptive young learner from her peers who are resistant to learning is that the receptive learner takes pride in demonstrating her competency at learned tasks or skills. The resistant young child displays no interest in developing a sense of accomplishment (Edwards, Gandini & Nimmo, 1994; Katz, 1993; McClellan & Katz, 1993).

There are a variety of ways to help children become more receptive learners, including exposure to words (reading and being read to); involvement in gestural and in kinesthetic expression (dramatic and symbolic play); engagement in drawings, paintings, sculpture, construction, music, dance; and environmental exploration. Games, group

projects and open-ended discussions, whole-language, science, social studies, and creative activities and further ways to encourage the receptive learner and coax the reluctant or resistant learner (Edwards & Springate, 1995; Stone, 1995).

The Italian Reggio Emilia preschool model of education (Edwards, Gandin & Nimmo, 1994) has found storytelling to be a particularly effective way of engaging whole classrooms of preschool children, because storytelling enables children to express their interests and emotions through their own stories and dramatizations, while developing related projects, as well as acquiring pre-literacy skills. However, storytelling projects must include outside input, as well as children's contributions (Edwards et al., 1994).

Even so, like dramatic play, storytelling in a collaborative context between teacher and students promotes among young children the social cooperation and sharing of ideas essential to developing receptive learning attitudes. At the Massachusetts Institute of Technology, computers are used to help young children design their own storytellers. Called SAGE (Storytelling Agent Generation Environment), the program allows children to design storyteller agents, create their own database of stories, and interact with their stories. Storytelling can be built around specific themes, which, in turn, promote collaborative learning, including the interaction of talking, reading and creating, all of which promote learning receptivity (Freeman & Sokoloff, 1995; Umaschi, 1996).

In summary, the studies reviewed provide evidence for the relationship between the behaviors that are rated by the BORS and both academic functioning and general development. Further, the behaviors included on the BORS are susceptible to improvement by experience and instruction. Finally, the behaviors show considerable

interaction with each other, in the service of promoting competence in a variety of learning situations.

Purpose of the Study

Traditional assessment, which uses psychometric measures, is limited in its ability to assess the learning potential of children. Instead, dynamic assessment, in which the examiner interacts with the child as both tester and facilitator, offers the potential of determining not only a child's present abilities but emerging levels of development as well. Moreover, because dynamic assessment is inherently interactive, the examiner can make observations and inferences that are far more relevant to the classroom setting than scores from standardized psychometric measures.

Even so, some systematic measurement is needed, not only to enable comparing an individual child's functioning to peers but also to monitor the student's progress. The Application of Cognitive Functions Scale with its subcomponent of the Behavior Observation Rating Scale has been designed as a tool for interactive dynamic assessment of young children. Yet it is a new procedure and, as such, its validity and reliability have yet to be fully documented. In particular, because behaviors are subjectively observed and assessed, the Behavior Observation Rating Scale needs further study to explore its validity and reliability.

In any assessment conducted by a school psychologist, inferences are made based on time-limited samples of performance and behaviors in classroom and home settings. The validity and reliability of these inferences are rarely directly addressed. This study investigated not only psychometric issues related to BORS, but to the assessment

situation in general. This study looked at the relationship between the time-limited samples of ratings of behaviors by an outside assessor and ratings of the same behaviors based on ongoing experience with the child by those working directly with the child, namely, the teacher and speech therapist.

Conclusions from the study can be generalized to other situations in which psychologists observe children for relatively brief period of time, and make inferences from these observations to more general classroom behaviors.

Hypotheses

1. There will be a significantly positive correlation between the experimenter's observation of students during a classroom lesson and the classroom teacher's scores of the student's general classroom behavior using the parameters of the ACFS Behavior Observation Rating Scale.
2. There will be a significant positive correlation between the ACFS Behavior Observation rating Scale scores of the researcher's observations of the children during one speech therapy session and the speech therapist's ratings of the child's general behavior during speech therapy.
3. There will be a significant positive correlation between the ratings of the child by the teacher and speech therapist.
4. There will be inter-rater agreement between the researcher and the ACFS principal author of 80 percent or above on each of the components, as well as the total score.

Methodology

Participants

Participants in this study were from the Hebrew Academy for Special Children. The sample included 25 children from four classes in the preschool setting, of whom 70% were Jewish and the rest Asian or Hispanic. Four teachers and seven speech therapists participated in this study. The children's ages ranged from two and a half to five year old, with the mean of 3.8. The children enrolled in the school exhibited various developmental delays such as speech disorders, cognitive delays, and behavioral disorders such as ADHD. In addition, some children were diagnosed with Downs' Syndrome and Pervasive Developmental Disorders and multiple handicapped conditions. All the participants in this study were eligible for preschool special education services.

The children lived in the Brooklyn and Long Island area in close proximity to the school. The socioeconomic background of the children's families varied greatly. Some of the children were from affluent homes; many were middle class and others were welfare recipients. Many children in this sample lived with their parents in bilingual English/Hebrew speaking homes. Some children lived in a non-residential setting. All teachers held master's degrees in Special Education, and the speech therapists held Master's degrees in Speech Therapy. The program provides comprehensive services including speech, occupational, and physical therapy. The class size varied from eight to ten children. Age, type of disability, and the severity of the handicapping condition determined the assignments of children to the classes. Each class had a teacher and two paraprofessionals, and in some cases the children required a one-on-one aide.

Each child in this study received biweekly speech therapy session, and each has been involved in speech therapy for a minimum of one year.

Measure

The Application of Cognitive Functions Scale (ACFS) Behavior Observation Rating Scale consists of seven components:

1) Self-Regulation: the extent of the child's ability to self-regulate and /or inhibit impulsive responding.

2) Persistence: the extent of the child's persistence to complete the task.

3) Frustration Tolerance: the child's ability to regain compliance when experiencing frustration related to task difficulty.

4) Flexibility: the child's attempts towards alternative solutions or self-correction while solving tasks.

5) Motivation: the extent of the child's affective response/reaction or interest in task or materials.

6) Interactivity: the extent of the child's reciprocal social interaction.

7) Receptivity: the extent of the child's openness to experiencing intervention by the mediator.

The ACFS Behavior Rating Scale describes the child's behavior during the administration of each subtest of the ACFS assessment. This scale has been abstracted from the ACFS and modified for application to classroom and therapy session observation by the ACFS first author. One version was for the use of the researcher, to ease recording of observation; only the recording format was altered. Another version was

created to facilitate completion by teachers and therapists. On both adaptations, the components are identical to the original scale. Each item has a rating from 1 to 3 ranging from no evidence (1) to optimal (3). The teacher's adapted form of the scale summarizes the components in one sentence and has a similar rating hierarchy. Each version of the scale yields a total possible score of 21 (range of 7-21). In this form the ratings were V (very much) S (sometimes) N (not at all). For purposes of calculation V equals 3, S equals 2 and N equals 1. This scoring system is consistence with original form.

Two previous studies included findings that translated to the current research with the BORS. Shurin's (1998) Master's thesis involved 26 four-year-old children. The study involved the Behavior Rating Scale that is embedded in each of the ACFS subtests. The first question explored the relationship between the behavior-rating total ACFS scores and total task ACFS scores: Does the child's behavior during the procedure relate to task competence? The correlation of .65 ($p < .001$) offered a qualified yes. Specific behaviors that related to task competence were Persistence, Frustration Tolerance and Flexibility. The study also provided evidence regarding intratest reliability of the BORS, documenting a significant correlation of each component to total BORS score.

Another attempt to evaluate interscore "r" reliability involved two independent raters (certified school psychologists) who attended a workshop offered by Lidz (in preparation). The attendees of the workshop were introduced to dynamic assessment and heard an overview of the ACFS that included the Behavior Observation Rating Scale. During a live demonstration of the ACFS, two participants volunteered to rate the child along with the author. Thus the raters had very minimal exposure to the scale. Nevertheless, the average rate of agreement among all raters was 74% and the behavior component that

elicited the highest levels of agreement were Persistence 100%, Frustration Tolerance 94%, and Motivation 78%.

Levy's (1999) study of interscore reliability check of the BORS also earned the exact agreement of ratings for the pretest was 77% and for the mediations 70%. The percentage of total agreements across all tasks was 67%.

Procedures

Materials for this study included the ACFS Behavior Observation Rating Scale in both questionnaire and rating scale format (Appendixes A & B), and letters of consent from administration and staff. The researcher secured permission to conduct the study from the program administrators. Since this was a non-intrusive study, no permission for individual students was necessary. However, the agency secured general permission for assessment, which is in each student's file. The researcher met with the teachers and speech therapists to solicit their cooperation, introduce them to the scales, and arrange for observation times.

The researcher asked the children's classroom teachers to complete the teacher version of the ACFS - BORS (Appendix A) based on their observations of the children's general classroom behavior. The researcher then observed and rated with the original ACFS - BORS (Appendix B) each child's participation during two classroom tasks: free play and circle time activities. The researcher observed a speech therapy session of each child participant and rated with the original ACFS BORS (Appendix B). The researcher then asked the speech therapist to complete the teacher/therapist version of the scale,

rating the child's behavior on the scale based on her observations of the children's general behavior during the speech therapy sessions.

Results

The first two hypotheses addressed the validity and the second two the reliability of the BORS.

The first hypothesis stated that there would be a significantly positive correlation between the experimenter's ratings and the mean score of all teacher's rating of the BORS. This relationship was analyzed using a Pearson r. The Cronbach Alpha for the six components observed by researcher was .69 and for the teachers' ratings was .78.

Table 1 – Correlation between Researcher's and Teachers' (n = 4) ratings

Self-regulation	.81***
Persistence	.74***
Flexibility	.58**
Motivation	.83***
Interactivity	1.00***
Receptivity	.76***
Total	.95***

** p< .01 ***p<.001

Data from Table 1 support this hypothesis. Table 1 shows a statistically significant positive correlation between the examiner and teachers' ratings of each component, and the total. In this analysis Frustration Tolerance was not included because the researcher

was not able to obtain a score on that component for many of the children. Four of the seven coefficients exceeded .80.

The second hypothesis stated that there would be a significant positive correlation between the researcher's ratings and the mean score of all speech therapists' ratings of students on the BORS. This was analyzed by using the Pearson r and results appear in Table 2.

The Cronbach Alpha for the six components rated by the researcher was .77 and for the speech therapist ratings was .81.

Table 2 – Correlation between Researcher's and Speech Therapists' (N=7) Ratings

Self-regulation	1.00***		
Persistence	.88***		
Flexibility	.88***		
Motivation	.78***	Interactivity	1.00***
Receptivity	.83***		
Total	.97***		

***p<. 001

Table 2 shows that the relationship between the researcher's and speech therapist' ratings were all highly statistically significant, with ratings on Self-Regulation and Interactivity reaching perfect agreement. Six of the seven coefficients exceeded .80.

In this analysis Frustration Tolerance was not included because the researcher was not able to obtain a score on that component for many of the children.

The third hypothesis stated that there would be a significantly positive correlation between the mean scores of the teacher's ratings and the mean score of all speech therapists ratings of the children on the BORS. This was analyzed by using the Pearson r,

and results appear in Table 3. The Cronbach Alpha for the seven components rated by teachers was .79 and for speech therapist was .81.

Table 3 - Correlation between Speech therapists (N=7) and teachers (N=4)

Self-regulation	.90***
Persistence	.62**
Frustration Tolerance	.88***
Flexibility	.62**
Motivation	.82***
Interactivity	.92***
Receptivity	.83***
Total	.94***

** p< .01 ***p<. 001

Table 3 shows that all BORS ratings by teachers and speech therapists on all components reached a high level of agreement, with six of the eight components exceeding .80. All seven components were included in this study.

For the first three hypotheses there were many correlations. Therefore it was necessary to apply the Bonferroni method, which adjust the statistical criterion for significance to .001.

The fourth hypothesis states that there will be an inter-rater agreement between the researcher and ACFS principal author of 80 percent on each component as well as the total score.

Table 4 – Inter rater Agreement between Researcher's and Author's ratings

COMPONENTS	% AGREEMENT
Self-regulation	67
Persistence	33
Frustration Tolerance	100
Flexibility	0
Motivation	100
Interactivity	100
Receptivity	100
Total Average Level Of agreement	71

Data from Table 4 show level of agreement between researcher and author on each of the seven components. Four of the seven components show 100% of agreement: Frustration Tolerance, Motivation, Interactivity and Receptivity. For the component of Persistence the author and researcher only agreed on 1 out of the three cases and on Flexibility there was no agreement. Overall, there was an inter-rater agreement of 71%.

Discussion and conclusion

This study sought to examine aspects of the validity and reliability of the AFCS-BORS in relation to both the parameters of the BORS, and in terms of the implications of the results of the study for the relationship between psychological assessment and classroom performance.

The results showed that there were highly significant positive correlations between the researcher's ratings behavior of students engaged in a sample classroom activity and their teachers' rating of children's general behavior.

There was also a significant positive correlation between the researcher's ratings of the children during a speech session and their speech therapist's ratings of the child's general behavior. Informal comparison of the ratings of classroom and speech therapy session suggests generally higher correspondence between the researcher and the speech therapist, which may reflect the greater ease of rating the children in the one to one situation of speech therapy. There was a significantly high correlation between ratings of the children by teachers and speech therapists. This supports the stability of the children's behavior across the two situations, as well as the reliability of the scale across situations, despite ratings by a variety of observes.

The wide range of inter-rater agreement between the researcher and the ACFS principal author suggests the need to interpret these results with caution, as well as the need for further research in this area. Another reason why the results obtained did not fully support the hypothesis could be attributed to the fact that only three cases of inter-rater agreement were used in this study. Also, two out of the three cases the researcher could not rate flexibility since it was not applicable, so the results were based on one case and there was no agreement for the component.

There were other limitations of this study; as a correlational study, it could only provide data regarding the degree of relationship between variables listed by the BORS. Thus, interpretation of the results is limited by the inability of the study to separate reliability of the scale from reliability of the behaviors tapped by the scale.

Other limitations concern the sample. Because the sample size was necessarily small (25) and limited to students with special needs, it is arguable that the results cannot be readily generalized to a larger and more diverse population, including a broader range of ethnicity's and subcultures.

The BORS ratings are also vulnerable to rater biases, particularly those with negative and positive halo effects, despite orientation of the raters by the researcher to minimize this. The limited number of raters made it difficult to separate scale from rater effects, especially because there were more speech therapists available than teachers at the time this study was conducted.

Given these limitations, the present study results not only largely supported the hypotheses but also compared favorably with other studies of the BORS. For example, Shurin (1999) selected a case for an interscorer reliability check of the Behavior Observation Rating Scale, comparing the scores assigned by Shurin and Lidz (1999). The percent of exact agreement for ratings during the pretest was 74% and 82% for ratings during mediation. When the ratings for pretest and mediation were combined, and the number of instances of agreements and disagreements for each behavior components across all tasks were compare, the percentage of agreement was 96%. A similar comparison was done in relation to another thesis (Levy, 1999). In this case, the exact

agreement of ratings for the pretest was 77%, and, for the mediations, 70%. The percentage of total agreements across all tasks was 67%.

Moreover, the present study, as well as other studies of the BORS scale (Lidz & Jepsen, 1997; Lidz, 1995) found considerable interaction and interrelationship among various components of behaviors measured on the BORS scale, thus extending the findings of other literature on those behaviors. For example, the high levels of agreement among testers in the present study for persistence, frustration tolerance, and motivation suggest high level of correlation among these behaviors, as also noted in the literature. Stone (1993) found that frustration tolerance seemed to be the basis for all intellectual effort but especially for motivation and persistence. On the other hand, Nelson-LeGall & Scott-Jones (1985) found too much frustration tolerance and persistence can lead to repetitive, unproductive behaviors and therefore must be leavened with high levels of flexibility.

Flexibility, in turn, correlates with interactivity, as shown by Patrick (1997) and Schickedanz (1994), who found that students who were flexible enough to adjust their behaviors to varying situations were the social and academic leaders in their classrooms. Schickedanz (1994), as well as Nelson-LeGall & approaches correlated with high frustration tolerance levels, whereas full completion of tasks seemed to be most readily achieved by the highest motivated children (Stone, 1993).

The BORS scale's ability to measure all these behaviors and show the correlation s among them makes it useful not only as a predictor of educational success (or lack of success) but as guide towards targeting individual children's specific problem areas.

Psychologists assume that the results of their assessment are generalizable to situations outside of the assessment context. In the case of school psychologists it is important that assessment results are generalizable to the classroom and other instructional settings of the student. Therefore, it is encouraging to find the strong relationship between the researcher's behavioral rating and those of both the teachers and the speech therapists, since the researcher's observations on a much more limited time sample. Thus, this study helped to demonstrate the usefulness of the BORS as an assessment aide for school psychologists seeking indicators of those behaviors that contribute to learning exhibited by young children both in the classroom and individually when removed from the classroom for individual assessment. The variables assessed by the BORS can provide a common language and frame of reference for psychologists, teachers, and therapists who provide services to the same children.

Possibilities for further study might include testing the BORS with a larger number and variety of examiner/raters and with a more diverse student population, including regular education students.

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APPENDIX A

Graduate School of Education & Psychology

TOURO COLLEGE

ACFS Behavior Observation Rating Scale

TEACHER/THERAPIST FORM

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Dear Teacher or Speech Therapist,

Please rate the child indicated on this form on the following items. The rating should reflect the child's typical behavior when you are trying to teach this child something new. You may add any comments you wish to explain or elaborate your ratings. Be sure to consider each item separately so that you avoid giving the same rating for each. Thank you very much for your time.

Child: _____ Rater: _____ Location: _____

Date: _____ How long have you known this child? _____

	3 Very much like this child	2 Sometimes like this child	1 Not at all like this child
1. The child shows good self control.	V	S	N
2. The child completes all tasks.	V	S	N
3. When frustrated, the child recoups quickly.	V	S	N
4. The child is flexible in solving problems and doesn't get stuck on one approach.	V	S	N
5. The child shows interest in and enthusiastic reactions to materials and tasks.	V	S	N
6. The child is able to participate in and take turns in conversations.	V	S	N
7. The child is a willing learner.	V	S	N

APPENDIX B

ACFS Behavior Observation Rating Scale

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Child's name: _____ Date of Observation: _____

Rater: _____ Location: _____ Activity: _____

For each activity observed, select one rating per behavior described below:

Behavior	Rating	Notes
SELF REGULATION: regulates attention and inhibits impulsivity.		
• Maintains attention and controls impulsivity	3	
• Requires mild intervention from adult	2	
• Requires significant intervention from adult	1	
PERSISTENCE: completes task or activity		
• Completes without seeking to terminate	3	
• Completes activity with encouragement	2	
• Quits and cannot be reengaged	1	
FRUSTRATION TOLERANCE: when frustrated, recoups and continues		
• When upset, is easily calmed and redirected	3	
• When upset, eventually calms down and reengages	2	
• When upset, cannot be calmed	1	
FLEXIBILITY: tries alternative solutions or approaches		
• Readily changes approach or self corrects	3	
• Attempts alternative, but new attempt is similar to first	2	
• Makes no change, gets stuck on initial attempt or approach	1	
MOTIVATION: shows positive affective response to and interest in activity		
• Shows enthusiastic response to activity	3	
• Shows neutral reaction, but proceeds without protest	2	
• Shows little or negative reaction; may state dislike	1	
INTERACTIVITY: shows reciprocal social interactions		
• Engages in turn-taking conversations with elaboration	3	
• Engages in turn-taking conversations with minimal responses	2	
• Engages in no turn-taking conversations	1	
RECEPTIVITY: shows openness to learning and being influenced by the teacher/therapist		
• Is a willing and receptive learner	3	
• Insonsistently willing and receptive	2	
• Quite resistant to learning	1	
	TOTAL	